



U.S. Department of Energy  
**Office of River Protection**

0056033

P.O. Box 450  
Richland, Washington 99352

DEC 19 2001

01-REQ-075

Mr. Michael A. Wilson, Program Manager  
Nuclear Waste Program  
State of Washington  
Department of Ecology  
1315 W. Fourth Avenue  
Kennewick, Washington 99336

**RECEIVED**  
JAN 02 2002  
**EDMC**

Dear Mr. Wilson:

SUBMITTAL OF FUNCTIONS AND REQUIREMENTS (F&R) DOCUMENTS FOR MILESTONES M045-03-T04 AND M-45-03-T03 TO THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY (ECOLOGY) FOR FORMAL REVIEW AND COMMENT AS DESCRIBED IN SECTION 9 OF THE HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (TRI-PARTY AGREEMENT) FOR AGREEMENT PRIMARY DOCUMENTS.

The U.S. Department of Energy, Office of River Protection (ORP) is pleased to transmit two copies each of:

- *Single-Shell Tank (SST) S-112 Full Scale Saltcake Waste and Retrieval Technology Demonstration Functions and Requirements RPP-7825, Revision 0 as Attachment 1; and*
- *SST 241-C-104 Full Scale Sludge/Hard Heel, Confined Sluicing and Robotic Technologies, Waste Retrieval Demonstration Functions and Requirements, RPP-7807, Revision 0 as Attachment 2 for Ecology's review.*

These documents are being submitted as primary documents in support of:

- 1) Milestone M-045-03-T04, "Submit C-104 Sludge/Hard Heel, Confined Sluicing and Robotic Technologies, Waste Retrieval Demonstration Functions and Requirements F&R Document," and
- 2) Milestone M-045-03-T03, S-112 "Saltcake Waste Retrieval Technology Demonstration Functions and Requirements" document completes ORP's obligations as described in the M-45-03-T03 and the M-45-03-T04 Milestones.

Approval of these documents, by Ecology, is required prior to initiating final design of the Tank 241-C-104 (C-104) and Tank 241-S-112 (S-112) Waste Retrieval Demonstration Systems.

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These documents are being submitted in a timely fashion so the project critical paths are not affected and to allow adequate time for ORP and Ecology review, revision, and approval as an agreement primary document.

Please review the draft F&R documents per Section 9.2.1 of the Tri-Party Agreement. We would appreciate receiving a single set of Review Comment Record (RCR) forms for each document that are free of duplicate or conflicting comments within 45 days. Comments should be provided with adequate specificity, including references when appropriate, to enable a timely and cost-effective revision and approval process.

The F&R documents establish the Demonstration Retrieval System specifications, inclusive of Leak Detection, Mitigation, and Monitoring (LDMM) for the C-104 and S-112 Waste Retrieval Demonstrations. The supporting scoping level Retrieval Performance Evaluation (RPE) is included as required. The scoping level RPE provides:

- Environmental and human health risk evaluation and data associated with the estimated volumes to be retrieved.
- Environmental and human health risk evaluation and data associated with the estimated maximum volume that could leak during retrieval and from residual wastes.
- Known and estimated radionuclide contamination and contaminant migration within the vadose zone as a basis of calculation.

The F&R documents address lessons learned, including LDMM, retrieval, instrumentation, and operational experience from previous ORP and industry related retrieval projects and develop the demonstration LDMM and retrieval strategies. Attachment 3 contains compliance matrices that identify each discrete requirement in Milestones M-45-03-T04 and M-45-03-T03 and what sections of the submitted documents meet those requirements.

C-104 and S-112 retrieval activities currently show significant promise for accelerated completion of the subsequent milestones for these efforts. Acceleration of S-112 retrieval could result in multi-million dollar savings. Continued progress on an accelerated schedule will significantly reduce the inventory of waste stored in the Single - Shell Tank earlier than anticipated. The target schedules provided in Attachment 4 are what ORP believes is achievable based on current maturity of the projects and the F&R documents submitted with this letter. The target schedules for the subsequent milestones are provided to support Ecology's work planning and will be updated as necessary.



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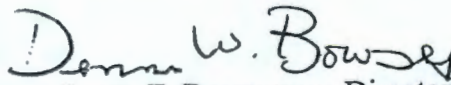
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It is ORP's hope that the substantial partnering between ORP and Ecology on these activities over the last year will lead to a timely review and approval process for these milestones, allowing both agencies to share in the successful completion of these demonstrations.

If you have any questions, please contact Robert Lober, ORP, (509) 373-7949, or Joe Cruz, ORP, (509) 372-2606.

Sincerely,

  
James E. Rasmussen, Director  
Environmental Management Division

REQ:RWL

Attachments (4)

cc w/attachs

:

S. J. Bensussen, CHG  
C. Defigh-Price, CHG  
W. T. Dixon, CHG  
F. R. Miera, CHG  
P.C. Miller, CHG  
R. Gay, CTUIR  
S. L. Dahl, Ecology  
R. F. Stanley, Ecology  
D. R. Sherwood, EPA  
D. Bartus, EPA at Ecology  
J. S. Hertz, FHI  
T. M. Martin, HAB  
D. W. Crass, NHC  
P. Sobotta, NPT  
K. Niles, Oregon Office of Energy  
J. B. Hebdon, RL  
R. Jim, YN  
Administrative Record

ATTACHMENT 1: S112 F&R Document

ATTACHMENT 2: C104 F&R Document

ATTACHMENT 3: Compliance Matrix

ATTACHMENT 4: TARGET SCHEDULES FOR C-104 and S-112 DEMONSTRATIONS



ATTACHMENT 3: TPA FUNCTIONS & REQUIREMENTS  
COMPLIANCE MATRICES

Item No.	TPA Requirement (M-45-03-T03)	Demonstrated Compliance to Requirement
1.	SUBMIT S-112 SALTCAKE WASTE RETRIEVAL TECHNOLOGY DEMONSTRATION FUNCTIONS AND REQUIREMENTS DOCUMENT.	RPP-7825, Rev. A, <i>Single-Shell Tank S-112 Full Scale Saltcake Waste Retrieval Technology Demonstration Functions and Requirements</i> , was formally submitted to Ecology via this letter.
1.a	THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE).	The S-112 integrated Waste Retrieval System/LDMM specifications, i.e., Functions and Requirements (F&R), are provided in Section 4.0 of RPP-7825, Rev. A. A scoping-level RPE for Tank S-112 is provided in Appendix B of this document.
1.b	THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION.	Appendix B of the F&R document provides an environmental and human health risk evaluation associated with varying residual waste volumes and retrieval leakage volumes to establish a risk basis for the tradeoffs between retrieval leakage and residual waste volume. The contribution of past leaks, along with the contribution of residual waste and retrieval leakage from other tanks in the farm, are also considered to provide a tank farm risk perspective. Known and estimated radionuclide contamination is documented in the RPE and the anticipated migration of this contamination within the vadose zone is used as the bases for the assessment of long-term risks.
1.c	LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS.	Section 3.0 of the F&R document provides a detailed description of the technical approach used in developing risk-based retrieval requirements for Tank S-112. The demonstration project's integrated LDMM/Retrieval Strategy is described in Section 5.0 of the F&R document.
1.d	THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS.	<u>A detailed description of the process used to gather lessons learned for waste retrieval related activities, including LDMM lessons learned that are applicable to this project, and a bibliography of sources used in gathering the lessons learned information, is presented in Appendix A of the F&amp;R document. Section 3.3 of the F&amp;R document provides a summary discussion of Appendix A.</u>
1.e	DOE WILL SUBMIT ITS S-112 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN.	The S-112 LDMM/Retrieval Strategy is included in Section 5.0 of the F&R document.
1.f	THE S-112 FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.	A draft of the C-104 F&R document (RPP-7807) was initially submitted to Ecology for informal review and comment in July 2001. Ecology provided ORP comments that have been taken into consideration. A number of clarifications recommended by Ecology have been incorporated, as applicable, into this document. The S-112 F&R document, (RPP-7825, Rev. A) is being formally submitted to Ecology for review



Item No.	TPA Requirement (M-45-03-T03)	Demonstrated Compliance to Requirement
		and comment as an agreement primary document.
2.	THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.	This document is being submitted to Ecology for formal review as an agreement primary document in advance of the 12/31/01 TPA Milestone for M-45-03-T03.

Item No.	TPA Requirement (M-45-03-T04)	Demonstrated Compliance to Requirement
1.	SUBMIT C-104 SLUDGE/HARD HEEL, CONFINED SLUICING AND ROBOTIC TECHNOLOGIES, WASTE RETRIEVAL DEMONSTRATION FUNCTIONS AND REQUIREMENTS DOCUMENT.	RPP-7078, Rev. 1, <i>Single-Shell Tank C-104 Full Scale Sludge/Hard Heel, Confined Sluicing and Robotic Technologies, Waste Retrieval Demonstration Functions and Requirements</i> , was formally submitted to Ecology was formally submitted to Ecology via this letter.
1.a	THIS DOCUMENT WILL ESTABLISH DEMONSTRATION SYSTEM SPECIFICATIONS (INCLUDING LDMM SYSTEM SPECIFICATIONS) AND WILL ALSO INCLUDE A SCOPING LEVEL RETRIEVAL PERFORMANCE EVALUATION (RPE).	The C-104 integrated Waste Retrieval System/LDMM specifications, i.e., Functions and Requirements (F&R), are provided in Section 4.0 of RPP-7807 Rev. A. A scoping-level RPE for the 241-C Tank Farm is provided in Appendix B of this document.
1.b	THE FUNCTIONS AND REQUIREMENTS DOCUMENT AND ITS ASSOCIATED RPE SHALL PROVIDE ENVIRONMENTAL AND HUMAN HEALTH RISK EVALUATION DATA/INFORMATION ASSOCIATED WITH ESTIMATED WASTE VOLUMES TO BE RETRIEVED, THE MAXIMUM VOLUME WHICH COULD LEAK DURING RETRIEVAL, AND RISK FROM RESIDUAL WASTE. THIS DOCUMENT WILL DETAIL KNOWN AND ESTIMATED RADIONUCLIDE CONTAMINATION AND CONTAMINANT MIGRATION WITHIN THE VADOSE ZONE AS BASES OF CALCULATION.	Appendix B of the F&R document provides an environmental and human health risk evaluation associated with varying residual waste volumes and retrieval leakage volumes to establish a risk basis for the tradeoffs between retrieval leakage and residual waste volume. The contribution of past leaks, along with the contribution of residual waste and retrieval leakage from other tanks in the farm, are also considered to provide a tank farm risk perspective. Known and estimated radionuclide contamination is documented in the RPE and the anticipated migration of this contamination within the vadose zone is used as the bases for the assessment of long-term risks.
1.c	LDMM AND RPE DOCUMENTATION PROVIDED WILL BE ADEQUATE TO ALLOW ECOLOGY TO ASSESS THE ADEQUACY OF THE DEMONSTRATION SYSTEMS.	Section 3.0 of the F&R document provides a detailed description of the technical approach used in developing risk-based retrieval requirements for Tank C-104. The demonstration project's integrated LDMM/ Retrieval Strategy is described in Section 5.0 of the F&R document.
1.d	THIS DOCUMENT WILL INCORPORATE LESSONS LEARNED, INCLUDING LDMM, RETRIEVAL, INSTRUMENTATION, AND OPERATIONAL EXPERIENCE FROM PREVIOUS DOE AND INDUSTRY RELATED RETRIEVAL PROJECTS.	<u>A detailed description of the process used to gather lessons learned for waste retrieval related activities, including LDMM lessons learned that are applicable to this project, and a bibliography of sources used in gathering the lessons learned information, is presented in Appendix A of the F&amp;R document. Section 3.3 of the F&amp;R document provides a summary discussion of Appendix A.</u>

Item No.	TPA Requirement (M-45-03-T04)	Demonstrated Compliance to Requirement
1.e	DOE WILL SUBMIT ITS C-104 LDMM STRATEGY AS PART OF THE FUNCTIONS AND REQUIREMENTS DOCUMENT, PRIOR TO INITIATION OF DESIGN.	A C-104 LDMM/Retrieval Strategy is included in Section 5.0 of the F&R document.
1.f	THIS DOCUMENT WILL BE SUBMITTED FOR ECOLOGY APPROVAL AS AN AGREEMENT PRIMARY DOCUMENT.	A draft of the C-104 F&R document (RPP-7807) was initially submitted to Ecology for informal review and comment in July 2001. Ecology provided ORP comments that have been taken into consideration. A number of clarifications recommended by Ecology have been incorporated into the document. The revised document (RPP-7807, Rev. A) is being formally submitted to Ecology for review and comment as an agreement primary document.
2.	THIS FUNCTIONS AND REQUIREMENTS DOCUMENT WILL BE TIMELY SUBMITTED SO THAT PROJECT CRITICAL PATH IS NOT AFFECTED, AND SO AS TO ALLOW ADEQUATE TIME FOR DOE AND ECOLOGY REVIEW, REVISION AND APPROVAL.	This document is being resubmitted to Ecology for formal review as an agreement primary document in advance of the 12/31/01 TPA Milestone for M-45-03-T04.



# ATTACHMENT 4: TARGET SCHEDULES FOR C-104 and S-112 DEMONSTRATIONS

TPA Milestone	Description	TPA Date	Target
M-45-03-T03	Submit S-112 saltcake waste retrieval technology demonstration Functions and Requirements document.	12/31/2001	11/30/2001
M-45-03D	Complete S-112 saltcake waste retrieval technology demonstration design (to include all physical systems including design and operating strategies necessary for Leak Detection Monitoring and Mitigation (LDMM)).	5/31/2003	4/30/2002
M-45-03E	Complete S-112 saltcake waste retrieval technology demonstration construction (to include all physical systems including design and operating strategies necessary for Leak Detection Monitoring and Mitigation (LDMM)).	9/30/2004	11/30/2002
M-45-03C	Complete full-scale saltcake waste retrieval technology demonstration at single-shell tank S-112. Waste shall be retrieved to DST system to the limits of the technology (or technologies) selected. Selected saltcake retrieval technology (or technologies) must seek to improve upon the past-practice sluicing baseline in the areas of expected retrieval efficiency, leak loss potential and suitability for use in potentially leaking tanks, this demonstration shall also include the installation and implementation of full-scale Leak Detection, Monitoring, and Mitigation (LDMM) technologies. The parties recognize and agree that this action is for demonstration and initial waste retrieval purposes. Completion of this demonstration shall be by written approval of DOE and Ecology.	9/30/2005	4/30/04
M-45-03-T04	Submit C-104 sludge/hard heel, confined sluicing and robotic technologies, waste retrieval demonstration Functions & Requirements document.	12/31/2001	11/15/2001
M-45-03G	Complete C-104 sludge/hard heel, confined sluicing and robotic technologies, waste retrieval cold demonstration.	6/30/2004	6/30/2003
M-45-03H	Complete C-104 sludge/hard heel, confined sluicing and robotic technologies, waste retrieval demonstration design (to include all physical systems including design and operating strategies necessary for Leak Detection Monitoring and Mitigation (LDMM)).	9/30/2004	10/30/2003
M-45-03I	Complete C-104 sludge/hard heel, confined sluicing and robotic technologies, waste retrieval demonstration construction (to include all physical systems including those necessary for Leak Detection Monitoring and Mitigation (LDMM)). Construction will be considered complete when all process equipment is installed and acceptance tests are completed.	9/30/2006	9/30/2005
M-45-03F	Complete full-scale sludge/hard heel, confined sluicing and robotic technologies, waste retrieval demonstration at tank C-104.	TBE (This milestone date will be established during the parties' M-45-00C negotiations.)	9/30/2006